J. FRYE.

Gang-Plow.

No. 16,912. Patented Mar. 31, 1857.

Fig. 1.

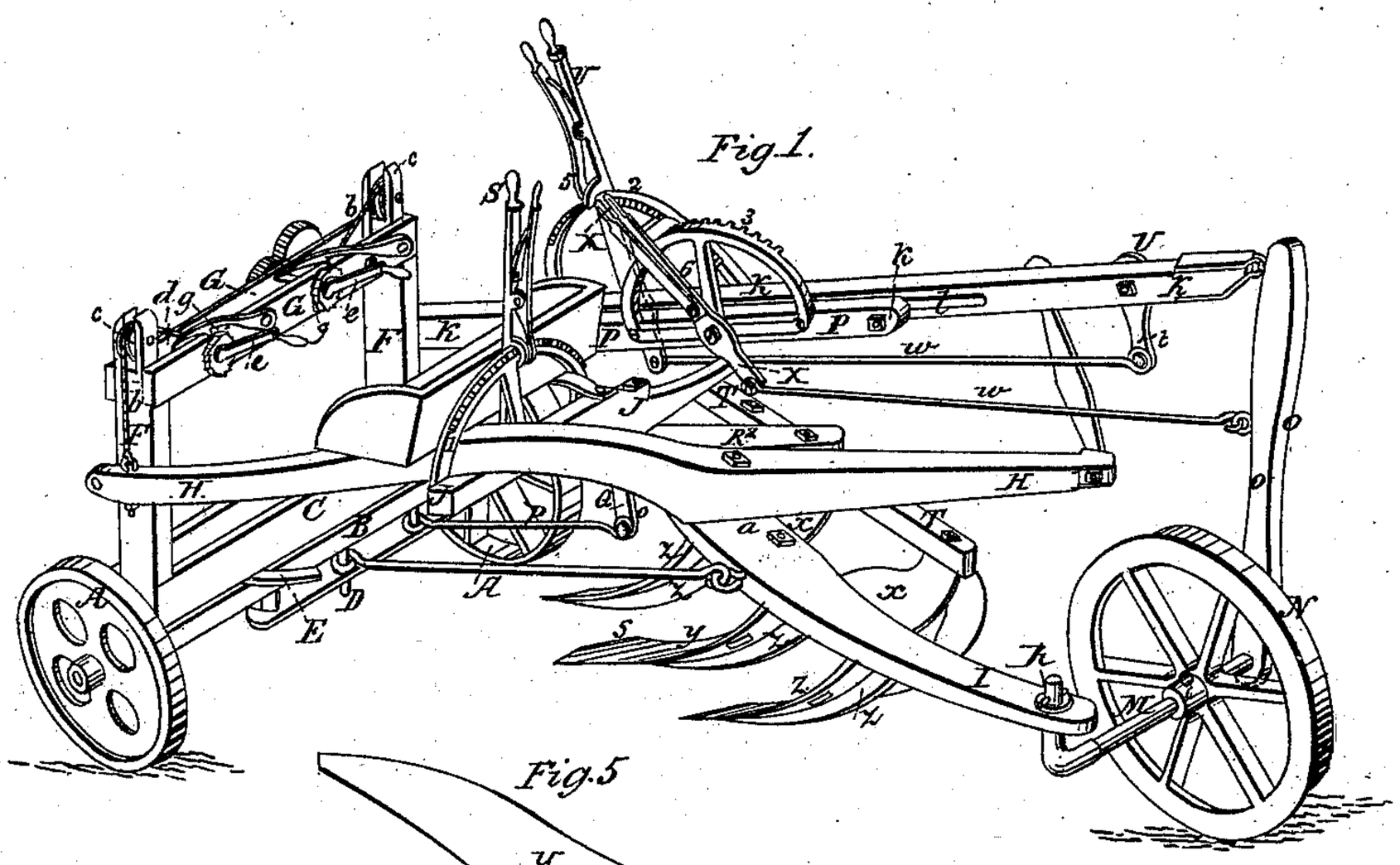


Fig. 5

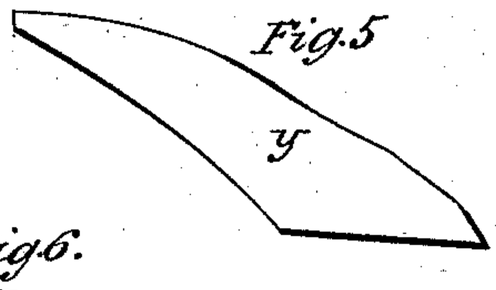


Fig. 6.

Fig. 2.

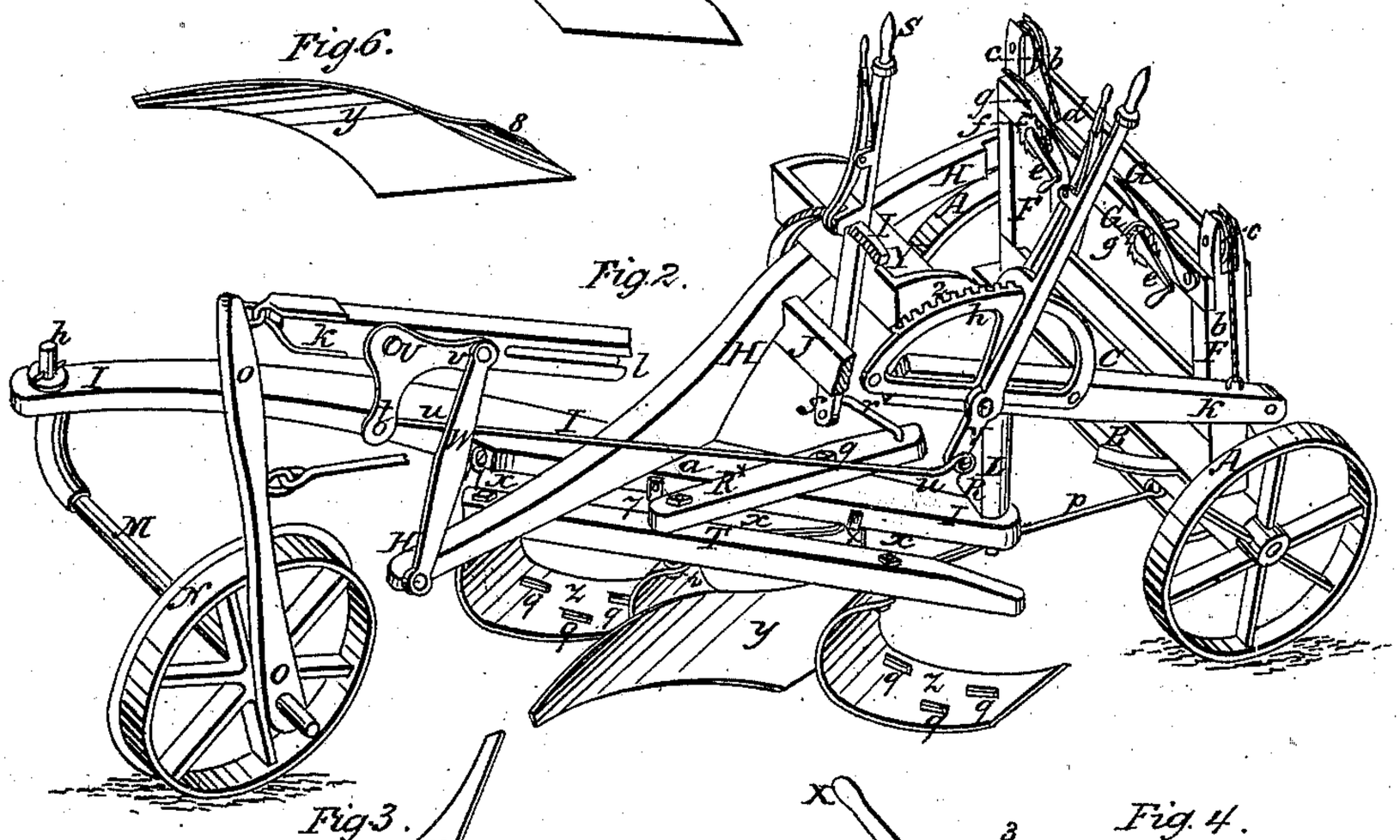


Fig. 3.

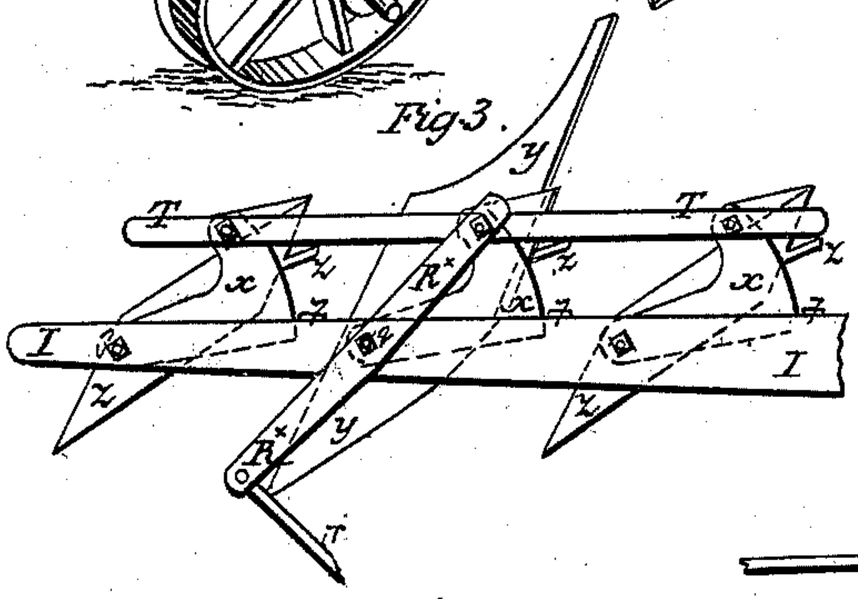
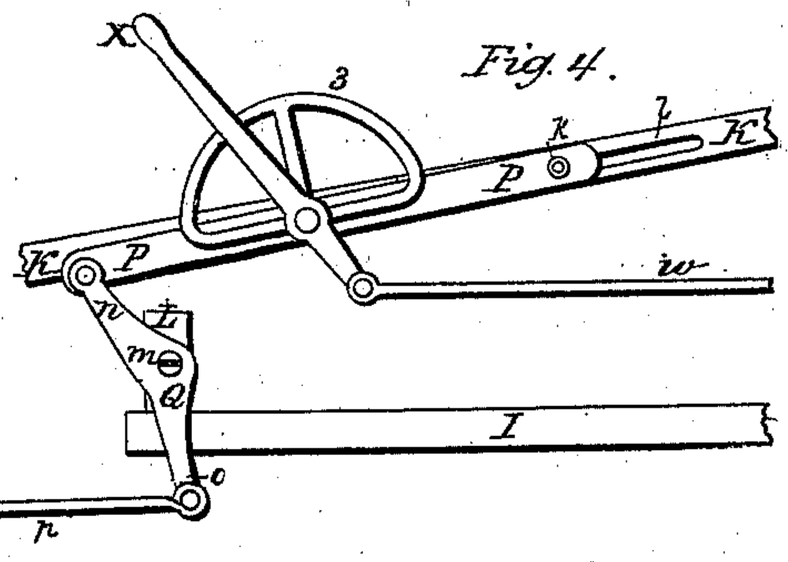


Fig. 4.



UNITED STATES PATENT OFFICE.

JESSE FRYE, OF SPRINGFIELD, ILLINOIS.

IMPROVEMENT IN GANG-PLOWS.

Specification forming part of Letters Patent No. **16,912**, dated March 31, 1857.

To all whom it may concern:

Be it known that I, JESSE FRYE, of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Gang-Plows; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view from one side. Fig. 2 represents a perspective view from the opposite side of the plow. Figs. 3, 4, 5, 6 represent detached portions of the plow, which will be specially referred to.

Similar letters of reference, where they occur in the several figures, denote like parts of the plow in all of them.

My invention relates to a gang or series of plows so combined with a set of supporting and guiding wheels and a frame as that the conductor mounted on the plow can adjust the width of the furrow-slices. The depth and direction of the furrows direct the turning of the plow at the end of the land, and all other things necessrry to the perfect guidance and operation of the plow in question.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

The front of the plow is supported on a pair of truck-wheels, A A, in which is mounted an axle, B. Upon this axle B is a bolster, C, which is united thereto by a king-bolt, D, passing through both bolster and axle, and at one side—viz., that farthest from the land—of their center. A fifth-wheel, E, is arranged on the axle between it and the bolster, so that the latter may freely turn on the former. A tongue-frame is rigidly connected to the axle B in such manner that one or two stiff tongues may be connected to it, and so that two or three horses may be hitched thereto abreast.

At each end of the bolster C there is framed or otherwise united an upright, F F, and these uprights are tied together near their tops by the ties G G, extending from one to the other and bolted together in a substantial manner. The above description embraces what I term the "front part" or "truck" of the machine, it constituting the main support of the other plow.

Two beams, H I, which pass from left to right and from right to left of the machine, crossing each other at the point *a*, where they are rigidly united by a bolt which passes through both, and a transverse piece, J, firmly bolted to both the beams H I, constitute mainly the frame of the macine. The rail K, inasmuch as it is rigidly attached to the beam I by a hollow metallic brace, L, through which a screw-bolt passes, may be deemed a part of the frame; but as it performs other functions than that of merely supporting I have not so described it. The front ends of the beam H and rail K are suspended to the uprights F F, respectively, on the bolster C by cords or chains *b b* passing over pulleys *c c*, and thence to drums or shafts *d d*, which are turned by winches *e e*. Ratchet-wheels *f f* are placed on the shafts *d d*, and dogs or pawls *g g* on the ties G, so as to hold the ends of said beam and rail at any desired height or adjust them at pleasure.

The beam I is bolted at its front end to the rail K by means of the brace or sleeve L, before described, and in the rear end of said beam is supported the bent or curved-up end *h* of an axle or shaft, M, which supports the bearing and guiding wheel N. The bent end *h* of the axle serves as a journal, so that the axle may freely swing on said journal in a horizontal plane. The wheel N is supported on the axle M by means of two collars, *i*, (one only being seen,) which are adjustable thereon by set-screws, for the purpose of adjusting said wheel to such part of the axle as the kind of work to be done may require.

To the opposite end of the axle M from where it is supported in the beam I is connected the lower end of a lever, O, the upper end of said lever being connected by loops or dead-eyes to the extreme rear end of the rail K.

Lying almost parallel with and alongside of the rail K is a piece, P, through the rear end of which passes a screw-bolt, *k*, and thence through a slot, *l*, in the rail K, so that said piece P may have a movement independent of the rail K. A bell-crank, Q, is pivoted at *m* to a projection, R, Fig. 2, on the brace L, and one arm, *n*, Fig. 4, of this bell-crank is connected to the front end of the piece P, and the other arm, *o*, of said bell-crank is united by a connecting-rod, *p*, to the front axle, B, at a point more remote from the center of said axle than is the king-bolt D, heretofore described.

A lever-beam, $R^{\times}$, is pivoted at *q* to the main beam I, the front end of which lever-beam is connected to the lower end of a hand-lever, S, by a rod, *r*, and the rear end of said

lever-beam is attached to the stock T, which contains the gang of plows at *s*. The stock T is in close proximity to the beam I, and is about parallel to it in any of its adjusted positions, being moved from or toward the beam I to widen or narrow the furrow-slices by the hand-lever S, heretofore described, and the lever-beam R.

On the outer and rear end of the rail K is pivoted a bell-crank, U, to the lower arm, *t*, of which is attached one end of a connecting-rod, *u*, the other end of said rod being united to a hand-lever, V. To the other arm, *v*, of said bell-crank is attached one end of a connecting-bar, W, the other end of which bar is united to the rear end of the beam H, the object of this arrangement being to raise or lower in a vertical line the gang of plows.

On the piece P is hung a third hand-lever, X, the lower end of which is connected to the lever O by a rod, *w*, the object of which connection is to change the direction of the steering-wheel N to throw the plows farther into or away from the land, or for turning the plow or guiding it in any manner.

The bell-crank Q, as heretofore stated, has one of its arms *o* attached to the axle B, remote from the center of said axle—viz., by means of the rod *p*. Now, when the axle is turned by means of the tongue, to which the horses are hitched, the rod *p*, through the bell-crank Q and the other connections, causes the piece P to move along the rail K, and as the piece P is also connected to the lever O by means of the hand-lever X and rod *w*, it is obvious that the lever O and the axle M, with the guiding-wheel N, will also be moved in a corresponding degree, so as to cause it to follow the path of the front truck and aid in bringing around the machine without cramping any of its parts. Should it be necessary, however, to change the direction of the guiding-wheel from that given to it by the turning of the horses, it can be done instantly by the hand-lever X, which can move independently of the movement of the piece P, to which it is hung, so that the turning of the horses or the front of the machine does not necessarily involve a similar or counter motion at the rear, that being entirely at the will of the conductor mounted on the plow. The independent movement of the rear wheel, N, also enables the conductor to throw the plows into or out of the land regardless of the tracking of the front part of the machine.

To each of the hand-levers S V X there is arranged a racked segment, 1 2 3, and spring-dogs 4 5 6, which take into said racks, respectively, to hold the parts operated by said hand-levers at such adjusted points as may from time to time become necessary; and all these hand-levers, as well as the winches *e e*, which raise or lower the front of the machine, are arranged in close proximity to the conductor's seat Y, so that he may from his seat regulate the depth and width of the furrows, guide and control the plow, and do everything from his seat that may be required in plowing.

The metallic stocks Z Z Z, to which the mold-board *y* is attached, may be cast in one piece, with angular-shaped plates *x* on their tops, as seen in Fig. 3, which plates are pivoted to both the beam I and plow-stock T, and serve as arms to maintain parallelism between said beam and plow-stock while they are moved toward or from each other, as circumstances may require. The metallic stocks Z have ribs *z* cast on their rear sides, to give them due strength to sustain the pressure upon them. Small projecting pieces 7, Fig. 2, are also arranged on the beam I, having a flange or lip upon them to hold up the after portions of the angular plates *x*.

The plow proper is composed of one single piece of shear-steel, which is cut out in the form shown in Fig. 5. It then has a lip, S, turned up upon it, and bent or curved, as shown in Fig. 6, so as to lie snugly in the curve of the metallic stock Z. This single piece of shear-steel forms the point, colter, share, land-side, and mold-board of the plow; and it is united to the metallic stock Z by screw-bolts passing through slots 9 in said stock from the rear into said shear-steel plate, the slots admitting of the adjustability or running forward of the plow-plate as its point becomes worn.

There are other details of the plow, such as the flange on the guiding-wheel N to give it a hold in the ground against lateral slipping, the difference in the diameters of the wheels A, so that the frame may lie horizontal, while one of said wheels may run on the land and the other in the furrow; but these are clearly shown in the drawings, and need not be further described.

The plows being suspended to the frame, which in turn is supported in the wheels, there is no friction between the earth and the sole of the plow. The plows raise, as it were, their furrow-slice from the ground at the same time that they sever it therefrom, and, gradually turning it over, deposit it on top of or alongside of those previously turned over. The only part of the plow that actually penetrates the ground is the thin shear-steel plate, and its thinness does not cause friction to any injurious extent.

Having thus fully described the nature of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The so hanging of a gang or series of plows upon their stock and beam as that the conductor upon his seat may, by a system of hand-levers and connecting-rods substantially such as herein set forth, adjust said series of plows to any desired depth or width of furrow, as herein set forth and explained.

JESSE FRYE.

Witnesses:
J. R. ANDERSON,
JNO. S. HOLLINGSHEAD.